REMARKS

Claims 1– 21 are pending in the application.

Claims 5, 11-16 and 20 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Claims 1, 4 and 21 have been rejected under 35 USC 102(e) as being anticipated by Cheeseman et al (US 6,680,933).

Claims 2, 3, 6-10, 17 and 18 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 5, 11-16, 19 and 20 have been indicated as allowable if rewritten to overcome the rejections under 35 USC 112, second paragraph and to include all of the limitations of the base claim and any intervening claims.

The original drawings are informal. A replacement set of formal drawings are included herewith.

Replacement Drawings

The original drawings are informal. A replacement set of formal drawings is provided herewith with each corrected sheet marked as a "Replacement Sheet." No new matter has been added by these corrections. The corrected drawings should comply with 37CFR 1.121(d).

Rejections under 35 USC 112

Claims 5, 11-16 and 20 have been rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Specifically, different limitations in claims 5, 11-16 and 20 have been rejected as indefinite since they provide insufficient antecedent basis for these limitations.

To overcome the insufficient antecedent basis rejection, the definite article "the" or "said" in each of the identified limitations in claims 5, 11-16 and 20 has been changed to the indefinite article "a." No new matter has been added by these amendments. As amended claims 5, 11-16 and 20 should now be definite and allowable under 35 USC 112, second paragraph.

Rejections under 35 USC 102(e)

In paragraph 4 of the Office action, Examiner has rejected claims 1, 4 and 21 under 35 USC 102(e) as being anticipated by Cheeseman et al (US 6,680,933).

Regarding claim 1 and with reference to the scheduler 144a in Cheeseman's Fig. 8, the Examiner states

"Cheesman teaches ... the distribution of service to said data packet flows being organized in service frames, each service frame offering a number of service opportunities to each of said data packet flows..."

Applicant's have searched Cheeseman's entire specification and has found no teaching or reference to "data packet flows being organized in service frames," as recited in our claim 1, lines 4-5. Rather with reference to Cheeseman's scheduler 144 in Fig.8, the presence of the priority scheduler P in 144a makes it impossible to define a "service frame offering a number of service opportunities to each of said data packet flows" as recited in our claim 1, lines 4-5. This is because in Cheeseman's priority scheduler P, if queue A1, for example, always has data packets available, then by normal operation scheduler P in 144a never moves on to service any of the next lower queues A2-Aj. This type of operation precludes any notion of a "service frame" being established. Cheeseman's scheduler P144 operation is shown in Fig. 9 and described at col. 12, line 52 through col.13, line 1. As shown and described (col. 12, lines 47-50) priority scheduler P144 is a "parent" to the "children" queues 142a and scheduler

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W144. Priority scheduler P144 uses pointer p0-p3 in a linked list to schedule, respectively, its children - queues A1-A3 and W144. (col. 12, lines 52-57). As further discussed (col. 12, line 63 through col. 13, line 1), priority scheduler P144 services all available data of the highest priority child having data (queue A1 in the example of Fig. 9) before moving on to the next lower priority child having available data (A2 in the example of Fig. 9). Since "all available data of the highest priority child," queue A1, must be exhausted before the next lower child, queue A2, is serviced there is no guarantee that any lower child will ever get service. This type of operation is described as "strict priority" type operation at col. 11, lines 11-14. Thus, Cheeseman's operation does not provide our "service frame" type operation and furthermore his servicing of "all available data" at a queue provides for an unlimited service opportunity to the highest priority queue before passing control to the next lower priority queue.

As a second difference over our present invention, Cheeseman provides unlimited service opportunity operation to the highest priority queue. In comparison, in the operation of our invention it does not matter if a guaranteed bandwidth (GB) queue or flow (e.g., gb1 in 402 of our Fig. 4) always has packets available, our first scheduler (PWS) will limit that queues service opportunity to ensure that other queues will receive service opportunities within a certain amount of time (corresponding to the duration of the service frame). This distinction is now more clearly recited in our amended claim 1, lines 13-16, which states "the service provided to each backlogged GB data packet flow being limited to its guaranteed-bandwidth requirement even when the backlog at that backlogged GB data packet flow exceeds its guaranteed-bandwidth."

A third distinction is that Cheesman uses a Weighted Fair Queueing (WFQ) scheduler W of 144a in Fig. 8, which "allocates weights (i.e., defined share) of link bandwidth, or can allocate explicit minimum bandwidth" (col. 11,

lines 17-20). This scheduler W operation is different than that of our second scheduler operation recited in claim 1, lines lines 22-25, which states "a second scheduler providing service to a second set of best-effort (BE) data packet flows during a second subframe of the service frame, said BE data packet flows having service requirements that <u>are not expressed in terms of guaranteed bandwidth requirements</u>. Although both schedulers are working on the basis of weights, the WFQ scheduler in Cheesman requires the explict allocation of weights or minimum bandwidth, whereas our second scheduler (SWS of Fig. 4) does <u>not</u> explicitly assign weights.

From the above discussions it is clear that our claim 1 differs from Cheeseman in three important respects:

(1) Claim 1 recites "service frame" type operation while Cheeseman does not.
(2) Claim 1 limits service to "guaranteed-bandwidth" level irrespective of the backlog at a queue, while Cheesman provides unlimited bandwidth service ("all available data") to high priority queue(s).
(3) Claim 1 recites that our second scheduler does <u>not</u> explicitly assign weights to BE data packet flows, while Cheesman requires the explict allocation of weights or minimum bandwidth .

Thus, for the above three reasons, Cheeseman cannot be said to be performing the <u>same function</u> in the <u>same manner</u> and producing the <u>same results</u> as now recited in amended claim 1. Consequently, Cheeseman does not anticipate amended claim 1 under 35 USC 102(e). Moreover, there is nothing in Chesseman that would hint-at or suggest to a person of skill in the art that either (1) a "service frame" type scheduler operation is desired for controlling data transmission from both high priority and lower priority data queues or (2) that limited guaranteed bandwidth should be provided to high priority data queues (data flows) irrespective of the data backlog at those high priority data queues. As a result,

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Cheeseman does not teach, suggest, or otherwise make obvious amended claim 1 under 35 USC 103(a).

Since claim 1 should now be allowable, so should dependent claim 4 be allowable for the same reasons as amended claim 1. Claim 4 is also allowable over Cheeseman for an additional reason. Regarding claim 4, the Examiner stated "Cheesman teaches the second scheduler (W in 144a) is a WRR scheduler." This is not correct: Cheesman only refers to a Weighted Fair Queueing (WFQ) scheduler and not explicitly to a Weighted Round Robin (WRR) scheduler.

Those skilled in the scheduling art know very well that a WRR scheduler is a particular case of WFQ scheduler, specifically one in the very low end of the implementation complexity range for WFQ schedulers. A key merit of our invention is in getting the low-complexity WRR scheduler to achieve bandwidth distribution accuracy and flexibility that in the prior art could only be achieved by higher-complexity WFQ schedulers. Cheesman's patent contains no explicit indication that a low-cost WRR scheduler can entirely sustain the sophistication of its bandwidth-handling capabilities. Thus, for this additional reason dependent claim 4 should be allowable over Cheeseman.

Independent method claim 21 has been amended consistent with the changes made to independent claim 1 to more clearly recite the features that distinguish it over Cheeseman. As amended, independent method claim 21 should now be allowable over Cheeseman under 35 USC 102 (e) or 35 USC 103(a), using the same reasoning used for the allowance of independent claim 1.

Allowable subject matter

Claims 2, 3, 6-10, 17 and 18 have been objected to as being dependent upon a rejected base claim, but indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As discussed above, since amended independent claim 1 should now be allowable over Cheeseman under 35 USC 102 (e) and/or 103(a), so should its dependent claims 2, 3, 6-10, 17 and 18 be allowable for the same reasons as independent claim 1.

Claims 5, 11-16, 19 and 20 have been indicated as allowable if rewritten to overcome the rejections under 35 USC 112, second paragraph and to include all of the limitations of the base claim and any intervening claims.

As discussed above, since amended independent claim 1 should now be allowable over Cheeseman under 35 USC 102 (e) and/or 103(a), so should its dependent claims 5, 12-16, 19 and 20 be allowable for the same reasons as independent claim 1.

Dependent claim 11 has been rewritten in independent form to include all of the limitations of the original base claim 1. As rewritten new independent claim 11 should now be allowable over Cheeseman under 35 USC 102 (e) and/or 103(a).

Additional prior Art

The additional prior art made of record and not relied upon has been noted.

Summary

In summary, amended independent claims 1, 11, and 21 as well as their respective dependent claims should now all be allowable under 35 USC 102(e), 103(a), and 112 and the same is respectfully requested.

If there is any remaining issue, applicant's attorney would welcome a call from the Examiner to resolve such issue.

Respectfully,

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